

Bachelor's/Master's Thesis

Trading Stocks on Blocks – Evaluating Decentralized Stock Markets

As an infrastructure for economic systems, blockchain technology challenges the role of traditional intermediaries and enables the creation of novel market designs and value chains. In “Trading Stocks on Blocks. Engineering Decentralized Markets, we utilize this potential and design a decentralized market framework that allows users to trade financial assets, such as stocks, without the involvement of intermediaries. This thesis builds on this approach (and others, such as [EtherEx](#) or [raidEX](#)) and aims to evaluate the potential of intermediary-free market setups with data from real-world financial market places. To do so, it relies on a two-step approach: The first step focuses on the development of a benchmarking model that formalizes prototype and network features and supports them with theoretical concepts from economics, operations research, and computer science. The second step implements the benchmarking model and its parameters as a simulation toolbox and uses actual orders from a large German stock exchange to evaluate the applicability of fully decentralized market setups across different asset classes.

Formal requirements

- Language: English.
- Start: Now.
- Organizational setup: One Master's Thesis or two interconnected team-based Bachelor's Thesis.
- Basic knowledge in finance (Essentials of Finance) and first experiences with statistical/mathematical software packages (e.g. SAS, MATLAB).
- Interest in a research-driven thesis, financial markets, and blockchain technology and the understanding of its underlying economic concepts.

For questions, do not hesitate to contact Benedikt Notheisen. To apply for the thesis, please send a current transcript of records, a CV, and a brief motivation (2-3 sentences) to benedikt.notheisen@kit.edu. For two Bachelor's Thesis a team application is highly welcome but not required.

References

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- Kondor, D., Csabai, I., Szüle, J., Pósfai, M. and Vattay, G. (2014), “Inferring the interplay between network structure and market effects in Bitcoin”, *New Journal of Physics*, Vol. 16 No. 12, p. 125003.
- Neudecker, T., Andelfinger, P. and Hartenstein, H. (2015), “A simulation model for analysis of attacks on the Bitcoin peer-to-peer network”, in *2015 IFIP/IEEE International Symposium on Integrated Network Management (IM), Ottawa, ON, Canada*, IEEE, pp. 1327–1332.
- Notheisen, B., Gödde, M. and Weinhardt, C. (2017), “Trading Stocks on Blocks. Engineering Decentralized Markets”, *Designing the Digital Transformation Proceedings of the 12th International Conference (DESRIST 2017)*, Vol. 12, pp. 474–478.
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